

Climate change affects how organic materials are decomposed

May 27 2016

A new study by researchers at Uppsala University and the Swedish University of Agricultural Sciences shows that the decomposition of organic materials in lakes, rivers and streams is controlled on a large scale by the climate, and in particular by the water balance. Knowing how quickly this decomposition happens is key to our ability to understand how the turnover of organic materials is affected by environmental changes.

Large amounts of organic material are carried from land ecosystems through rivers and streams down to the oceans. On its way, some of this material is broken down by micro-organisms in the water.

The wetter the climate, the faster water flows through the landscape to the ocean. This shortens the amount of time the water spends inland, reducing the time micro-organisms have to decompose different organic materials in the water.

To study how this affects the rate of organic material decomposition, researchers at Uppsala University, the Swedish University of Agricultural Sciences, and the University of Girona in Spain, compiled data from more than 300 published studies, where decomposition rate was measured for different water retention times. The researchers found that the organic material was decomposed at a higher rate when water turnover was higher – due to more easily decomposed compounds remaining in the water to a higher extent. They then compared that connection to how water turnover is expected to change with different

future climatic scenarios. Some areas will get wetter, with water flowing faster into the oceans, while others will get dryer. Therefore decomposition rate is expected to increase in many northern areas, but decrease in for example the Mediterranean region.

The researchers found that the average half-life of organic material in lakes and watercourses is 2.5 years. This is significantly shorter than in most other environments, for example earths, oceans and sediment. Inland water can therefore be viewed as a kind of global hot spot for [decomposition](#) of [organic material](#).

The research is a collaboration between the Swedish University of Agricultural Sciences and a Spanish research institute, and has been funded by the Swedish Research Council Formas, the Knut and Alice Wallenberg Foundation, and a grant from the Wenner-Gren Foundations to Núria Catalán who is lead author of the article.

The findings have been published in *Nature Geoscience*.

More information: Núria Catalán et al. Organic carbon decomposition rates controlled by water retention time across inland waters, *Nature Geoscience* (2016). [DOI: 10.1038/ngeo2720](https://doi.org/10.1038/ngeo2720)

Provided by Uppsala University

Citation: Climate change affects how organic materials are decomposed (2016, May 27)
retrieved 10 April 2024 from
<https://phys.org/news/2016-05-climate-affects-materials-decomposed.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.
